

A.4.4 SWMU 10

Description

SWMU 10 was identified based on the indicated presence of the TEL burial on the Refinery Leaded Burial Map. SWMU 10 consists of two or three suspected 20-foot by 20-foot TEL sludge burials located in the southwest corner of Tank Basin 771¹. It is located in the west central portion of the East Yard, approximately 5,000 ft west of the Arthur Kill.

As shown on Figure A.4.3 and summarized on Table A.4.3, 18 borings, 25 soil samples and two water samples have been used to characterize SWMU 10. In addition, relevant data from the OWSS investigations are also shown on Table A.4.3 for delineation purposes. A total of ten borings were installed during the 1st-Phase RFI, and one sample was analyzed for Skinner's List VOCs and SVOCs, TPH, lead and TEL. During the Full RFI, 24 soil samples were analyzed for lead and TOL, 12 samples were analyzed for TCL VOCs and SVOCs, 12 additional samples were analyzed for BTEX, three samples were analyzed for PAHs, one sample was analyzed for TAL metals and six samples were analyzed for arsenic and copper. One sample was also analyzed for SPLP lead and physical characteristics.²

Soils

SWMU 10 is a confirmed TEL site; the 1st-Phase soil sample contained lead (41,600 mg/kg), TOL (780 mg/kg) and benzene (2.3 mg/kg) above applicable soil delineation criteria. VOCs, PAHS and metals were also detected above soil delineation criteria during the full RFI.

The following table summarizes the number of samples where soil delineation criteria were exceeded.

Analyte	Surface Soils (0 to 2 ft)	Fill Material (>2 ft)	Native Soils	Total
Benzene	0/6	3/15	0/4	3/25
Other VOCs	0/6	1/15	0/4	1/16
Benzo(a)pyrene	1/4	0/8	0/4	1/16
Other SVOCs	1/4	0/8	0/4	1/13
Lead	1/6	5/15	0/4	6/25
TOL/TEL	1/6	3/15	0/4	4/25
Other TAL Metals ^a	0/0	3/7	0/0	3/7

^a Totals do not include naturally-occurring metal compounds in excess of the delineation criteria (Al, Ca, Fe, Mg, Mn, K and Na).

¹Two of the three burials are adjacent to each other.

²Physical characteristics specified in Appendix A, Task IV of Module III of the HWSA Permit included saturated and unsaturated permeability tests, moisture content, relative permeability, bulk density, porosity, soil sorptive capacity, CEC, TOC, pH, Eh and grain size distribution.

Surface Soils (0 to 2 ft bgs)

Some black staining was noted in one of the borings (U010012) at one to three feet bgs. Benzo(a)pyrene (2.8J mg/kg) and several other PAHs, lead (10,700 mg/kg) and TOL (38.6 mg/kg) were detected above delineation criteria in one sample (S0822A3) collected from the zero to two foot layer. There were no exceedances in any of the other surface soil samples.

Fill Material (>2 feet bgs)

The fill layer is between 3.5 and 19.5 ft thick in the immediate vicinity of SWMU 10. A sheen was observed in the boring description for S0822, but none of the other borings showed any evidence of residual NAPL. Black staining, odor and/or PID readings greater than 100 ppm were noted in the lithologic descriptions of several other borings. Measurable NAPL has not been detected at this SWMU.

As shown on the above table, five of the subsurface fill samples had lead and/or TOL above the soil delineation criteria. One of the soil samples (S0822B2), which contained lead at 9,250 mg/kg was also analyzed for SPLP lead, but lead was not detected in the SPLP sample. Therefore, although this SWMU is a confirmed TEL burial site, the soil does not appear to be a source of lead to groundwater. Three of the unsaturated fill samples also contained benzene (ranging from 2.3 mg/kg to 10 mg/kg) above the most conservative soil delineation criterion (e.g., IGWSCC). Arsenic, copper, nickel and naturally-occurring iron and manganese were also detected in the fill material above the most conservative delineation criteria.

Native Material

A clay/peat layer was noted in boring logs at approximately 20 feet bgs in the vicinity of SWMU 10. Four samples were collected from the native soils underlying the fill material, and analyzed for TCL VOCs and SVOCs, lead and TOL. No exceedances of soil delineation criteria were found in any of the native soil samples, indicating that the soil impacts are vertically delineated at SWMU 10.

Groundwater

As shown on Figure A.4.3, monitoring well MW-131 was installed to investigate potential impacts to groundwater from SWMU 10. Benzene (490 µg/L) and one TIC (aniline at 38J µg/L) were detected above the groundwater delineation criteria at this location. Although it is possible that SWMU 10 is the source of dissolved benzene detected at MW-131, it does not appear that the TOL/lead associated with this SWMU is impacting groundwater, because lead was not detected in either the SPLP sample or in the groundwater sample from MW-131. Additional discussion of groundwater impacts can be found in Section 8 of the RFI report.

Summary

SWMU 10 is a confirmed TEL burial site. The greatest impacts found at SWMU 10 are found within the fill layer. A number of compounds, including benzene, benzo(a)pyrene, lead and TOL, are present at concentrations above their respective criteria. Arsenic, copper and nickel were also detected above applicable delineation criteria in fill soils. Arsenic concentrations, which range between 55.6 mg/kg and 73.8 mg/kg, are within the normal range for soils, particularly glauconitic soils in the Coastal Plain (Saunders, 2003). No constituents were detected above delineation criteria in the native material, indicating that the site-related soil impacts are limited to surface soil/fill and have been delineated vertically. Based on the analytical results from MW-131, it is probable that groundwater has been impacted by this SWMU. SWMU 10 will be included for further evaluation in both the soil and site-wide groundwater portion of the CMS.